FOREST DEVELOPMENT RESEARCH TRUST FUND

ANNUAL REPORT

1989/90

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The Honourable LeRoy Fjordbotten
Minister of Forestry, Lands and Wildlife
403 Legislature Building
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Sir:

I have the honour of submitting the Annual Report of the Forest Development Research Trust Fund for the fiscal year ending March 31, 1990.

Respectfully submitted,

C. B. Smith, Chairman
Alberta Forest Research
Advisory Council

FOREWORD

The Forest Development Research Trust Fund Act was legislated in 1974 by the Legislative Assembly of Alberta. This Act established the Forest Development Research Trust Fund (FDRTF) and created a Forest Research Advisory Council, which was to establish research priorities and evaluate research proposals submitted to the Fund.

In 1987, the Canadian Council of Forest Ministers recommended that each province establish a single advisory committee to oversee forestry-related research and development activities. The Alberta Department of Forestry, Lands and Wildlife responded by expanding and restructuring the Alberta Forest Research Advisory Council (AFRAC) to include representation from provincial and federal governments, academia, the Alberta Research Council and senior executives of the Alberta forest industry. AFRAC sets and reviews research priorities and coordinates research activities in the province. The 1974 Forest Research Advisory Council was renamed the Forest Development Research Trust Fund (FDRTF) Committee and is responsible for evaluating research proposals submitted to the Fund.

The purpose of the FDRTF is to provide financial contributions to both the private sector and public institutions to conduct problem-oriented and basic research in the area of forest management. The research results should lead to improved forest land management practices and should improve forest use to make it more in harmony with long-term economic, aesthetic and social values.

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PROJECTS COMPLETED

PROJECTS COMPLETED

1. *Characterization of the native growth hormones of juvenile lodgepole pine and their relationship to vegetative growth, and especially to the aspect of inherent superiority in vegetative growth.*

   Dr. R.P. Pharis - University of Calgary

2. *General equilibrium model of the Alberta economy with reference to the forest sector.*

   Dr. Constantino - University of Alberta

3. *Variability of soil temperature, substrate water content and tree growth on two drained and undrained Alberta peatlands.*

   Dr. R.L. Rothwell - University of Alberta
   P. Rivard, Ph.D. candidate, University of Alberta
   U. Silins, M.Sc. candidate, University of Alberta

CHARACTERIZATION OF THE NATIVE GROWTH HORMONES OF JUVENILE LODGEPOLE PINE AND THEIR RELATIONSHIP TO VEGETATIVE GROWTH, AND ESPECIALLY TO THE ASPECT OF INHERENT SUPERIORITY IN VEGETATIVE GROWTH.

INVESTIGATORS: Dr. R.P. Pharis - University of Calgary
Dr. B. Dancik - University of Alberta
Dr. F. Yeh - University of Alberta

DURATION: Three years (1987/88 to 1989/90)

FUNDING:

1987/88	1988/89	1989/90	TOTAL TO DATE
29,879	26,367	15,000	71,246

OBJECTIVES:

1. To determine efficient and cost-effective ways to screen families, and genotypes within families, for inherently superior vegetative traits.

2. To understand what factors control early vigour of seeded and planted stock and how this vigour may possibly be enhanced.

CONCLUSION: Conclusions from the study found that:

1. family rank for height and stem volume in the field at age 10 years shows a high significant correlation with rank for height in the field at age 6 years, and in turn with rank for height or stem dry weight in the phytotron at age 3 months.

2. endogenous gibberellin (GA) concentration is positively correlated with rank performance. Fast-growing families have high concentrations of the polar gibberellins GA_1 and/or GA_3 in their stems. Other differences in GA concentrations between stem and needles, and fast- and slow-growing families were found.

GENERAL EQUILIBRIUM MODEL OF THE ALBERTA ECONOMY WITH REFERENCE TO THE FOREST SECTOR.

INVESTIGATORS: Dr. L.F. Constantino, University of Alberta
Dr. M.B. Percy, University of Alberta
Dr. W.E. Phillips, University of Alberta

DURATION: Three years (1987/88 to 1989/90)

FUNDING:

1987/88	1988/89	1989/90	TOTAL TO DATE
17,913	14,522	13,200	45,635

OBJECTIVES: To assess the impact of:

1. federal-provincial agreements with the province;
2. annual allowable cut regime on production in wood products and pulp industries;
3. forestry expansion on industries with competing uses for land base, and on regional and provincial incomes and employment;
4. movements in exchange rates, wood products, and pulp and paper prices on forest industry and provincial incomes; and,
5. technological change in forest products technology on employment and production in the forest industry through time.

CONCLUSION: The final report has been submitted, and includes full documentation on how the sector model was built. Two scenarios were tested in the application of the model.

A copy of the model, which runs on a Lotus spreadsheet, was submitted and is available for distribution.

VARIABILITY OF SOIL TEMPERATURE, SUBSTRATE WATER CONTENT AND TREE GROWTH ON TWO DRAINED AND UNDRAINED ALBERTA PEATLANDS.

INVESTIGATORS: Dr. R.L. Rothwell, University of Alberta
P. Rivard, University of Alberta
U. Silins, University of Alberta

DURATION: Two years (1988/89 to 1989/90)

FUNDING:

1988/89	1989/90	TOTAL TO DATE
12,256	9,977	22,233

OBJECTIVES:

1. To evaluate the effects of peatland drainage on tree growth, in terms of substrate temperatures and water contents (including the magnitude and variability of each), on temporally and spatially drained and undrained peatlands.

2. To relate the variability of thermal and hydrologic regimes of drained and undrained peatlands to variability in growth.

CONCLUSION: Surface substrate water content was reduced in the drained area, most effectively in the 0-20 cm depth layer. However, differences in moisture content between the drained and undrained areas decreased with depth, until approximately 30 cm where water contents were found to be similar.

Seasonal mean soil temperatures were 1° - 2°C warmer in the surface layers of the drained areas. However, at 30 cm depth, temperatures in the drained area were 1° - 4°C cooler than in the undrained area.

Tree growth on the drained sites showed a positive response, especially for tamarack, but less-so for black spruce. Variability in tree growth over time increased on the drained sites.

PROJECTS RENEWED

PROJECTS RENEWED

1. *Lichen regeneration rates in Alberta following various types of logging disturbance and wildfire.*

   Dr. P. Woodard - University of Alberta

2. *Control of Armillaria root rot in intensively managed lodgepole pine stands.*

   Dr. P.V. Blenis - University of Alberta

LICHEN REGENERATION RATES IN ALBERTA FOLLOWING VARIOUS TYPES OF LOGGING DISTURBANCE AND WILDFIRE.

INVESTIGATOR: Dr. P. Woodard, University of Alberta

DURATION: Three years (1988/89 to 1990/91)

FUNDING:

1988/89	1989/90	TOTAL TO DATE
8,000	15,000	23,000

OBJECTIVES:

1. To assess lichen regeneration on cutblocks aged 2 - 30 years, in the Weldwood (Hinton) FMA, and on unlogged fire-origin forest types in the 2 (if possible) to >180-year-old range.

2. To develop a procedural system to monitor lichen regeneration on cutblocks.

3. To assess the effectiveness of the timber harvesting guidelines developed for the FMA with respect to maintaining caribou habitat, focusing specifically on lichen regeneration.

PROGRESS: A total of 30 cutblocks have been sampled in four age classes (30 years, 20 years, 10 years and <2 years), as well as two ecoregions (Subalpine and Upper Boreal). Preliminary findings suggest that:

1. Cutblocks 10 years old or less support few lichens, and those present are early successional species.

2. Certain 20- and 30-year-old cutblocks can support substantial quantities of terrestrial lichens (comparable to 50 - 200-year-old fire-disturbed stands).

3. There are virtually no arboreal lichens in cutblocks less than 10 years old and only minute quantities in blocks aged 20 - 30 years.

FUTURE WORK: Additional fieldwork will continue during the 1990 field season. This work will target age and site gaps in the sampling framework. Work is proceeding as planned.

CONTROL OF ARMILLARIA ROOT ROT IN INTENSIVELY MANAGED LODGEPOLE PINE STANDS.

INVESTIGATOR: Dr. P.V. Blenis, University of Alberta

DURATION: Three years (1988/89 to 1990/91)

FUNDING:

1988/89	1989/90	TOTAL TO DATE
8,990	4,530	13,520

OBJECTIVE: To develop guidelines for thinning overstocked lodgepole pine stands that are infested with Armillaria root rot.

PROGRESS: The 66 plots established in previous field seasons were revisited. Initially killed trees and newly killed trees were stem mapped to record locations of mortality. Low mortality was experienced in the one year since plot establishment. This was expected, since Armillaria will take longer than one year to colonize the roots of the thinned trees and produce rhizomorphs through the soil to infect the healthy trees.

FUTURE WORK: The field plots will be revisited in 1990 to examine mortality. Dead trees will be noted and located on the stem maps. Distribution of mortality can then be analyzed to determine if it appears random or clumped around the location of trees that had died previous to thinning. However, Armillaria grows relatively slowly; therefore, it may be several years before any relationship is evident.

NEW PROJECTS

NEW PROJECTS

1. *Semiochemical mediated control and monitoring of root collar weevil in forestry plantations in Alberta.*

   Dr. E.A. Dixon, University of Calgary
   Dr. H. Wieser, University of Calgary

SEMIOCHEMICAL MEDIATED CONTROL AND MONITORING OF ROOT COLLAR WEEVIL IN FORESTRY PLANTATIONS IN ALBERTA

INVESTIGATORS: Dr. E.A. Dixon, University of Calgary
Dr. H. Wieser, University of Calgary

DURATION: Three years (1989/90 to 1991/92)

FUNDING:

1989/90	TOTAL TO DATE
16,380	16,380

OBJECTIVES:

1. To develop and test an effective trapping device to monitor and reduce populations of root collar weevil, Hylobius warreni.
2. To confirm the major host kairomonal components for root collar weevil.
3. To establish a positive behaviourial bioassay of weevil extract either from frass or whole body.
4. To isolate and identify aggregate and/or sex pheromones of Hylobius warreni.
5. To investigate the electrophysiological response of root collar weevil to extracts, extract fractions and single chemical components by electroantennogram bioassay.
6. To establish forest pest management strategies, including: trap design, trap deployment, semiochemical release rates and trap monitoring protocols.

FINANCIAL STATEMENTS

FOREST DEVELOPMENT RESEARCH TRUST FUND

FINANCIAL STATEMENTS

MARCH 31, 1990

Auditor's Report

Balance Sheet

Statement of Revenue, Expenditure and Unexpended Funds

Notes to the Financial Statements

OFFICE OF THE AUDITOR GENERAL

ALBERTA LEGISLATURE

OFFICE OF THE AUDITOR GENERAL

AUDITOR'S REPORT

To the Council of the Forest Development
Research Trust Fund

I have examined the balance sheet of the Forest Development Research Trust Fund as at March 31, 1990 and the statement of revenue, expenditure and unexpended funds for the year then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the financial position of the Fund as at March 31, 1990 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Donald D. Dalman

FCA
Auditor General

Edmonton, Alberta
June 29, 1990

FOREST DEVELOPMENT RESEARCH TRUST FUND

BALANCE SHEET

AS AT MARCH 31, 1990

		1990	1989
ASSETS			
Current:			
Cash		$135,347	$124,065
LIABILITIES			
Current:			
Research grants payable		$ 25,280	$ 45,300
Due to the Province of Alberta	(Note 3)	15,649	-
Unexpended funds		94,418	78,765
		$135,347	$124,065

The accompanying notes are part of these financial statements.

FOREST DEVELOPMENT RESEARCH TRUST FUND

STATEMENT OF REVENUE, EXPENDITURE AND UNEXPENDED FUNDS

FOR THE YEAR ENDED MARCH 31, 1990

	1990	1989
REVENUE		
Contributions by the Province of Alberta (Note 3)	$ 85,000	$ 85,000
Interest	15,653	13,171
	100,653	98,171
EXPENDITURE		
Research grants	69,351	126,347
Returned to the Province of Alberta (Note 3)	15,649	-
	85,000	126,347
Excess (deficiency) of revenue over expenditure	15,653	(28,176)
Unexpended funds at beginning of year	78,765	106,941
Unexpended funds at end of year	$ 94,418	$ 78,765

FOREST DEVELOPMENT RESEARCH TRUST FUND

NOTES TO THE FINANCIAL STATEMENTS

MARCH 31, 1990

Note 1 Authority

The Forest Development Research Trust Fund operates under the authority of the Forest Development Research Trust Fund Act, Chapter F-13, Revised Statutes of Alberta 1980.

Note 2 Changes in Financial Position

A statement of changes in financial position is not provided as disclosure in these financial statements is considered to be adequate.

Note 3 Contributions by the Province of Alberta

The Department of Forestry, Lands and Wildlife provides contributions annually for research and council members' expenditure incurred by the Fund. Where expenditure is less than the contributions in any given year, the balance is repayable to the General Revenue Fund.

Note 4 Administration Expenses

Salaries, accommodation, and other administrative costs incurred in the administration of the Fund are borne by the General Revenue Fund and are not reflected in these financial statements.

Note 5 Commitments

As at March 31, 1990, the Fund had research grant commitments totalling $123,800 (1989 $74,110).

Note 6 Approval of Financial Statements

These financial statements were approved by management.